

Upgrades to navigations Capabilities for GEODYN

Completed Technology Project (2015 - 2016)



Project Introduction

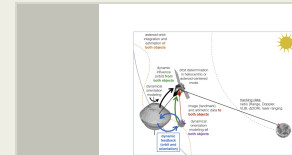
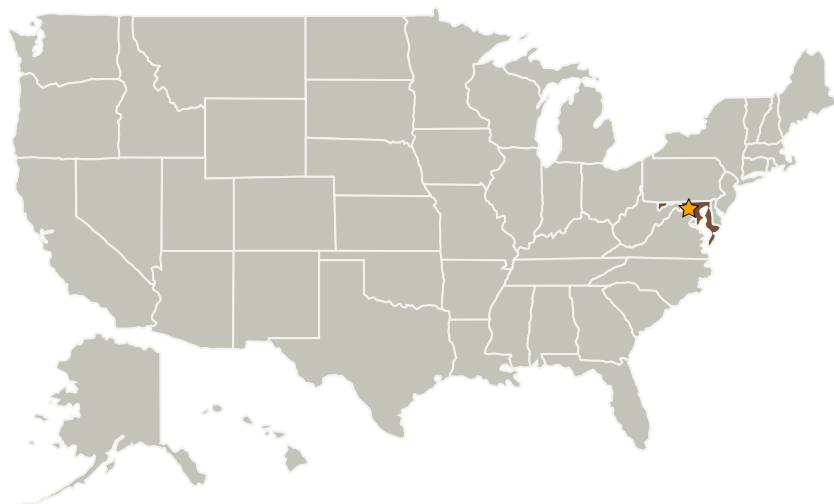
GEODYN is GSFC's scientific orbit determination software. GEODYN uses tracking data to estimate satellite orbital parameters and also parameters of the body that a satellite is orbiting (gravity parameters are one example). We are upgrading GEODYN's capabilities to take into account the complex environment of a binary asteroid system.

Our GEODYN upgrades for a binary asteroid system can be divided into two categories: (1) force model upgrades and (2) measurement model upgrades. At the start of our project, GEODYN's measurement model works for Earth based Deep Space Network tracking (Range and Doppler observations) and altimeter and camera observations taken from the artificial satellite to the body that the satellite is orbiting. GEODYN's measurement model will be upgraded to know when the altimeter or camera instrument is pointing away from the orbited (primary) asteroid and is taking observations to the secondary asteroid.

Anticipated Benefits

N/A

Primary U.S. Work Locations and Key Partners



The Considerations of a Binary Asteroid Ssystem

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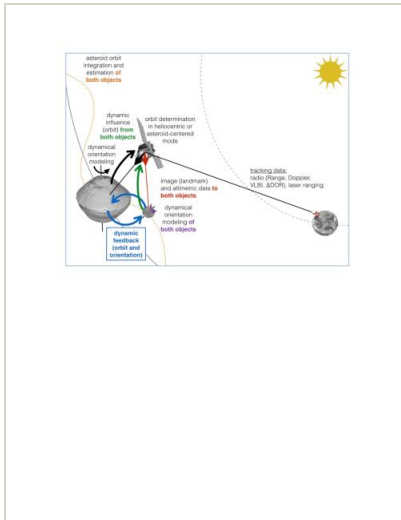


Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations

Maryland

Images



GEODYN Binary Asteroid Work

The Considerations of a Binary Asteroid Ssystem

(<https://techport.nasa.gov/image/18990>)

Project Website:

<http://sciences.gsfc.nasa.gov/sed/>

Organizational Responsibility

Responsible Mission Directorate:

Mission Support Directorate (MSD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Center Independent Research & Development: GSFC IRAD

Project Management

Program Manager:

Peter M Hughes

Project Manager:

Brook Lakew

Principal Investigator:

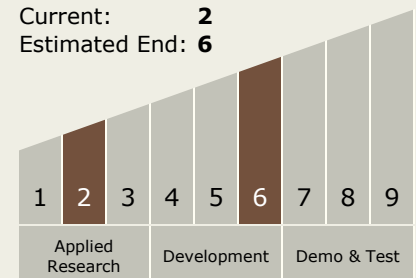
David D Rowlands

Technology Maturity (TRL)

Start: 2

Current: 2

Estimated End: 6



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Technology Areas

Primary:

- TX17 Guidance, Navigation, and Control (GN&C)
 - └ TX17.2 Navigation Technologies
 - └ TX17.2.1 Onboard Navigation Algorithms